

### Claims

5

1. Use of a ATP7A-interacting molecule for the preparation of a pharmaceutical composition for the treatment of a neurogenerative disease.

10

2. The use of claim 1, wherein the ATP7A-interacting molecule is a ATP7A-inhibitor.

15

3. The use of claim 2, wherein the inhibitor is selected from the group consisting of antibodies, antisense oligonucleotides, siRNA, low molecular weight molecules (LMWs), binding peptides, aptamers, ribozymes and peptidomimetics.

20

4. The use of any of claims 1 to 3, wherein ATP7A is part of an intracellular protein complex.

5. The use of any of claims 1 to 4, wherein the interacting molecule or inhibitor modulates the activity of gamma-secretase and/or beta-secretase.

25

6. The use of any of claims 1 to 5, wherein the neurodegenerative disease is Alzheimer's disease.

7. A method for identifying a gamma-secretase and/or a beta-secretase modulator, comprising the following steps:

30

a. identifying of a ATP7A-interacting molecule by determining whether a given test compound is a ATP7A-interacting molecule,

b. determining whether the ATP7A-interacting molecule of step a) is capable of modulating gamma-secretase and/or beta-secretase activity.

8. The method of claim 7, wherein in step a) the test compound is brought into contact with ATP7A and the interaction of ATP7A with the test compound is determined.
- 5 9. The method of claim 8, wherein the interaction of the test compound with ATP7A results in an inhibition of ATP7A activity.
- 10 10. The method of any of claims 7 to 9, wherein in step b) the ability of the gamma-secretase and/or the beta-secretase to cleave APP is measured, preferably wherein the ability to produce Abeta 42 is measured.
11. A method for preparing a pharmaceutical composition for the treatment of neurodegenerative diseases, comprising the following steps:
- 15 a. identifying a gamma-secretase and/or beta-secretase modulator according to claims 7 to 10, and
- b. formulating the gamma-secretase and/or beta-secretase modulator to a pharmaceutical composition.
- 20 12. The method of claim 11, further comprising the step of mixing the identified molecule with a pharmaceutically acceptable carrier.
- 25 13. A pharmaceutical composition comprising a ATP7A-inhibitor as defined in any of claims 1 to 5.
14. A pharmaceutical composition obtainable by the method according to any of claims 11 or 12.
- 30 15. The pharmaceutical composition according to any of claims 13 or 14 for the treatment of neurodegenerative disease such as Alzheimer's disease and related neurodegenerative disorders.

- 54 -

16. A method for treating or preventing a neurodegenerative disease, preferably Alzheimer's disease administering to a subject in need of such treatment or prevention a therapeutically effective amount of a pharmaceutical composition of any of claims 13 to 15.

5

17. Use of a ATP7A-interacting molecule for the modulation of beta-secretase and/or gamma-secretase activity in vitro.